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(54) **Total gelatine replacement in chewy candy and/or fruit chews**

(57) The present invention relates to total gelatine replacement in chewy candies and fruit chews. The gelatine is replaced by a combination of a maltodextrin and

wheat gluten. Maltodextrin is preferably combined with a (partially) hydrolysed wheat gluten. The maltodextrin has a DE between 0.1 and 20, preferably DE between 4 to 10, more preferably DE is 5.

**Description**Technical field

- 5 **[0001]** The present invention relates to gelatine replacement in chewy candies and fruit chews. The gelatine is replaced by a combination of a maltodextrin and wheat gluten.

Background of the invention

- 10 **[0002]** The basis of a chewy candy is a sugar/glucose syrup combination and a gelatinizing agent, whereby during the processing no Maillard reaction is occurring. Examples of gelatinizing agents are gelatine, gum arabic, maltodextrin or a modified starch. A certain amount of fat is included to improve texture and prevent excessive stickiness in the mouth. The mixture after blending is pulled and aerated, which process results in a slightly elastic product having a short texture.
- 15 The chews have a lasting effect in the mouth, somewhat like chewing gum but without the presence of the insoluble gum base. The chewy candy can have a non - grained or grained texture, the latter can be obtained by sucrose re-crystallization during pulling or by addition of fondant. To obtain an excellent lasting effect of the end product generally gelatine is used in the formulation. Chewiness is dictated by gelatine level. The other mentioned gelatinizing agents do not give rise to the desired elastic properties after pulling of the mass.
- 20 **[0003]** Gelatine is obtained by hydrolysis of collagen. Collagen is the major intercellular protein found in the connective tissue of animal skins and bones. Gelatine is generally used for its gel forming ability. A firm gel is formed in aqueous medium. Gelatine is mainly used in foods, pharmaceutical preparations or photographic products. It is also widely used as a colloid, it is particularly effective as an emulsifier and stabilizer of emulsions and foams such as water crystals in ice cream, air in marshmallows and oils in water.
- 25 **[0004]** Gelatine has found wide application, and it is used in many different products. The product has a very heterogeneous composition and this may influence the characteristics.
- [0005]** The gelatine used for application in chewy candies and chews is generally a low bloom type (120-130 bloom) used at low dosage level (0.5 to 2%).
- 30 **[0006]** GB 2 152 351 relates to a process for the manufacture of toffee. Toffee is a traditional confectionery based on emulsions of fat in aqueous systems comprising sucrose, glucose, water, milk protein, without gelatinizing agent, such as gelatine. Occurrence of Maillard reaction is an essential part during the preparation of toffees. Its major ingredients are sugars of both dairy and non-dairy origin. The sugars of dairy origin are normally lactose introduced in the form of condensed skimmed milk. The condensed skimmed milk contains lactose but the sweetening power of lactose is relatively low and in order to improve the sweetness of the condensed milk, sucrose is added. In order to increase the sweetness, hydrolysed whey syrup is applied. In hydrolysed whey syrup a major proportion of the original lactose is hydrolysed to glucose and galactose which have considerably more sweetening power than lactose. Accordingly, the invention provides a method for the production of toffee in which at least a part of the carbohydrate is supplied in the form of hydrolysed whey syrup and at least a further part is supplied in the form of a maltodextrin.
- 40 **[0007]** US 5,476,678 relates to a composition for and method of producing fibre-enhanced confection or snack. It relates to a composition for a method of producing a chewy fructose-based confection fortified with supplemental dietary fibre, which can be stabilised to produce a long textured taffy or a short textured nougat confection (aerated confection). The invention also relates to a method of making a nougat-textured candy without introducing a traditional protein-containing frappe. Aeration is achieved by using a blend of pre-gelatinised starches, mono- and di-glycerides and polyglycerol esters of fatty acids. The invention for producing supplemental dietary fibre-containing confections uses a high-grade spray dried fine particle size gum arabic powder. The further addition of very fine particle size guar gum and apple pectin adds soluble fibre, without impacting texture or sensory qualities.
- 45 **[0008]** US 4,292,337 relates to a chewy sugar-free confectionery material based on sorbitol and a sugar-free swelling agent and a method for the production thereof. The swelling agent may be mixtures of complex polysaccharides such as carrageenate, pectins, agar, alginates, carob bean flour, tragacanth, methyl cellulose, carboxymethyl cellulose, gelatine, gum arabic and/or low sugar maltodextrin.
- 50 **[0009]** US 4,759,940 relates to a method of producing bars (solid tablets) composed of milk and simple and complex sugars. From a nutritional standpoint, the value of milk is well recognised and it is the object of the invention to provide a method of producing bars made of milk and simple and complex sugars of various nature and in varying proportions to one another. The final product is an energetic product, which can meet the nutritional requirements of a broad range of potential consumers in need of a proteic and energetic contribution when confronted with particular bodily or physiological situations. The bars to be obtained may also have an important dietetic function through an appropriate selection of sugars having a low caloric contribution level and/or a decay-fighting function.
- 55 **[0010]** US 4,601 907 relates to a chewy confection item having a chewing consistency similar to that of chewing gum

and providing a novel chewing texture, an effect of improved perception of the size of the item in the mouth, and a prolonged release of flavour or sweetness on chewing. The centre filling should have approximately the same chewy consistency as the outer chewing casing, so that at least on first bite through the confection, the consumer does not perceive an abrupt change of hardness or softness at the interface between casing and the filling. The aeration of the centre filling assists in imparting to the centre filling a chewy consistency approximating that of the outer chewing gum casing. The whipping agent serves to assist in the aerating of the centre filling, and assists in maintaining the aerated condition of the product during subsequent processing steps in storage. Examples of suitable whipping agents include egg albumin, gelatine, cereal protein isolate, agar, pectin, and mixtures thereof.

**[0011]** Already since a long time one is searching for gelatine replacers. Preferably, such a replacer is to be made from easily obtainable vegetable material having a homogeneous composition and having all the essential characteristics of gelatine. The interest in this search has lately increased since the outbreak of the BSE disease. Bovine skin and bones form a major source of collagen used for gelatine production.

The present invention discloses a product composition, which can suitably be used for replacing the gelatine. The product is of vegetable origin and use of the product gives rise to chewy candies and chews having the desired organoleptic properties.

#### Summary of the invention

**[0012]** The present invention discloses chewy candies and fruit chews comprising a maltodextrin and wheat gluten. Wheat gluten is defined as vital wheat gluten, fractions of vital wheat gluten, modified wheat gluten, (partially) hydrolysed wheat gluten and/or mixtures thereof. The maltodextrin has a DE between 0.1 and 20, preferably between 4 to 10, more preferably DE of 5. The product does not contain gelatine and the gelatine is replaced with a combination of maltodextrin and vegetable protein, preferably wheat gluten.

**[0013]** The present invention also discloses a method for the preparation of chewy candies or fruit chews comprising the steps of:

- a) disperse wheat gluten in warm water and keep the solution warm,
- b) dissolve the sugar and maltodextrin in water, add glucose syrup, cook to the desired temperature, and cool the syrup,
- c) mix with other ingredients,
- d) cool the mass further,
- e) bring the cooled mass into desired form.

#### Detailed description of the invention

**[0014]** The present invention describes chewy candies and fruit chews wherein the gelatine is replaced by a combination of a maltodextrin and wheat gluten, these components give body and elasticity, respectively. Wheat gluten is defined as vital wheat gluten, fractions of vital wheat gluten, modified wheat gluten, (partially) hydrolysed wheat gluten and/or mixtures thereof. Wheat gluten is used in combination with different maltodextrin types. The maltodextrins have a DE from 0.1 to 20 DE, preferably between 4 and 10 DE, more preferably a DE of 5, and are from any available starch source. Maltodextrins based on corn and potato have been favourably tested in a standard "chewy candy" formulation. In general wheat gluten is used to replace the gelatine. It is therefore added in an amount of between 0.5 and 10% (w/w), preferably between 0.5% and 5% (w/w). The maltodextrin is used in an amount of between 0.5 and 15% (w/w), preferably between 0.5 and 5% (w/w).

**[0015]** The obtained results indicate that the total amount of gelatine can for example be replaced by a combination of modified wheat gluten (C☆Pro® S211BO, available from Cerestar, and which is enzymatically hydrolysed wheat gluten) and a corn based 5 DE maltodextrin (C☆Dry® MD 01904, available from Cerestar). The obtained chewy candy has a similar long lasting (elasticity), similar texture profile and similar mouthfeel as the standard type with gelatine. The gelatine is replaced by an equal amount of modified wheat gluten while 3% of maltodextrin is added to the formulation, more generally, the gelatine is replaced by 0.5 to 10 % wheat gluten and 0.5 to 15 % maltodextrin.

**[0016]** The preparation method when using the combination of maltodextrin and wheat gluten, more preferably (partially) hydrolysed wheat gluten, is very similar to the standard type. As for gelatine the wheat gluten is dispersed into 50% of the total amount of water at 60°C and added to the sucrose/glucose mix. The maltodextrin is cooked-up with the sucrose/glucose mix, in order to dissolve the maltodextrin, followed by cooling the syrup. Fat, such as hydrogenated palm kern oil, and hydrogenated coconut oil chosen amongst other types of fat, is melted and emulsifiers such as lecithin and glycerol monostearate (GMS) can optionally be dispersed in melted fat, followed by addition to the cooled syrup. After cooling the wheat gluten dispersion is added.

The modified wheat gluten is easily incorporated into the mass during pulling, a similar pulling time gives a similar

mass density which is comparable to the standard with gelatine.

Addition of emulsifiers can be avoided, when non-refined wheat starch-based maltodextrin is used as the maltodextrin contains lyso-lecithin, or when good dispersing facilities are available. Glycerol monostearate (GMS) can be added to improve dispersion of lecithin.

Different end textures of the chew can be obtained by changing the wheat gluten and/or maltodextrin level. The obtained chewy candy has a long lasting (elasticity), good texture profile and good mouthfeel.

#### Example 1

**[0017]** The chewy candies were prepared as follows:

##### 1. Standard formulation :

- Dissolve the gelatine in warm water (70-80°C) and keep the solution warm at 60°C.
- Dissolve the sugar in water, add glucose syrup and cook to the desired temperature, cool the syrup in a planetary mixing machine to 105°C.
- Melt fat and disperse lecithin and glycerol monostearate (GMS) in the melted fat, and mix slowly in.
- Add the warm gelatine solution and mix slowly in.
- Pour onto cooling table, where it is "tempered" by folding to the desired body.
- Add during the mixing process or on the cooling table, colour, flavour and acid.
- The tempered, flavoured mass is pulled to the final texture required.
- After further cooling, the mass is formed into pieces by pressing or extrusion and wrapped.

##### 2. Formulation example for the present invention :

- Disperse the modified wheat gluten in warm water at 60°C and keep the solution warm at 60°C.
- Dissolve the sugar and maltodextrin in water, add glucose syrup and cook to the desired temperature, cool the syrup in a planetary mixing machine to 105°C.
- Melt fat and disperse the lecithin and glycerol monostearate (GMS) in the melted fat and mix slowly in.
- Add the warm modified wheat gluten solution and mix slowly in.
- Pour onto cooling table, where it is "tempered" by folding to the desired body.
- Add during the mixing process or on the cooling table, colour, flavour and acid.
- The tempered, flavoured mass is pulled to the final texture required.
- After further cooling, the mass is formed into pieces by pressing or extrusion and wrapped.

The following table shows the amounts and conditions used for making chewy candies on lab scale and on pilot scale. Alternatively, when non-refined wheat starch-based maltodextrin is used the addition of lecithin can be avoided as the maltodextrin contains lyso-lecithin.

**[0018]** The products were obtained as described above and they showed the same elasticity and texture. It can be concluded that the mixture of wheat gluten (C☆Pro) and maltodextrin (C☆Pur) can be used for completely replacing gelatine.

	Standard	Formulation of invention
Sucrose	38.0	38.0
Glucose 42 DE	39.0	39.0
C☆PUR 01904	-	3.0
Water	9.5	9.5
Fat (hydrogenated coconut oil)	8.0	8.0
GMS	0.6	0.6
Lecithin	0.4	0.4
	1.5	-
Gelatine (120 bloom)	3.0	3.0
Water	-	1.5
C☆PRO S211BO		
Colour	s.q.	s.q.
Flavour Lemon type	2.2 g/kg	2.2 g/kg
Citric acid sol. 50%	1%	1%
LAB TRIAL		
Cooking temp. °C	135	135
End moisture %	9.5	9.7
Hardness before pulling g	850	812
after 1 week	4000	4300
Pulling time (D=1) min.	10.0	10.0
PILOT		
Cooking temp. °C	133	132
Pulling temp. °C	64	60
Pulling time (D=1) min.	13	13
Forming rope °C	40	46
Wrapping °C	36	42

#### Claims

1. A chewy candy or fruit chew comprising sucrose, a glucose syrup, wheat gluten, maltodextrin.
2. A chewy candy or fruit chew according to claim 1 wherein wheat gluten is vital wheat gluten, fractions of vital wheat gluten, modified wheat gluten, partially hydrolysed wheat gluten and/or mixtures thereof.
3. A chewy candy or fruit chew according to claim 1 wherein the maltodextrin has a DE of between 0.1 and 20, preferably a DE between 4 and 10, more preferably a DE of 5.
4. A chewy candy according claim 1 wherein wheat gluten is present between 0.5 to 10% (w/w), preferably between 0.5 to 5% (w/w), and maltodextrin is present between 0.5 to 15% (w/w), preferably between 0.5 to 5% (w/w).
5. A process for preparing chewy candies or fruit chews comprising the steps:

- a) disperse wheat gluten in warm water and keep the solution warm,
- b) dissolve the sugar and maltodextrin in water, add glucose syrup, cook to the desired temperature, and cool the syrup,
- c) mix with other ingredients,
- d) cool the mass further,
- e) bring the cooled mass into desired form.

6. A process according to claim 5 characterised in that it consists of the following steps:

- a) disperse wheat in warm water and keep the solution warm,
- b) dissolve the sugar and maltodextrin in water, add glucose syrup and cook to the desired temperature, cool the syrup,
- c) melt fat,
- d) optionally disperse emulsifiers in the melted fat,
- e) mix melted fat composition slowly with the product of step b),
- d) add the warm protein solution to the product of step e) and mix slowly,
- e) cool the mass, and temper,
- f) add during the mixing process or during cooling, colour, flavour and acid,
- g) pull the tempered, flavoured mass to the final texture,
- h) form the cooled mass into pieces by pressing or extrusion and wrap.



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# EUROPEAN SEARCH REPORT

Application Number  
EP 99 30 6073

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	WO 98 15189 A (WARNER LAMBERT CO) 16 April 1998 (1998-04-16) * claims 22,29,74; examples 1,3,4 *	1-3	A23G3/00
A	EP 0 340 035 A (KRAFT INC) 2 November 1989 (1989-11-02)		
X	US 5 482 722 A (COOK RICHARD B) 9 January 1996 (1996-01-09) * column 3, line 25 - line 54; claim 2; examples 12,10 * * column 2, line 16 - line 22; claims 1,5,55 *	1,2	
A	US 3 769 029 A (GANZ A) 30 October 1973 (1973-10-30) * column 1, line 56 - line 66 * * column 4, line 36 - column 5, line 13; claims 1,8,9; examples 1,6-9,12,23 *	1	
A	US 5 476 678 A (WALTER DARA L ET AL) 19 December 1995 (1995-12-19)		TECHNICAL FIELDS SEARCHED (Int.Cl.7)
A	US 5 527 554 A (OLINGER PHILIP M ET AL) 18 June 1996 (1996-06-18) * page - *		A23G
A	GB 2 152 351 A (SPECIALIST DAIRY INGREDIENTS) 7 August 1985 (1985-08-07) * the whole document *	5	
A	US 4 601 907 A (KNEBL LESLIE F ET AL) 22 July 1986 (1986-07-22) * the whole document *	5	
A	US 4 097 616 A (GUILLOU JEAN PIERRE ET AL) 27 June 1978 (1978-06-27) * the whole document *	5	
The present search report has been drawn up for all claims			
Place of search <b>THE HAGUE</b>		Date of completion of the search <b>26 November 1999</b>	Examiner <b>Guyon, R</b>
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons &amp; : member of the same patent family, corresponding document</p>			

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 99 30 6073

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
The members are as contained in the European Patent Office EDP file on  
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26-11-1999

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9815189 A	16-04-1998	AU 4607797 A	05-05-1998
		EP 0929230 A	21-07-1999
		US 5882702 A	16-03-1999
EP 0340035 A	02-11-1989	AU 623656 B	21-05-1992
		AU 3574289 A	24-11-1989
		CA 1334354 A	14-02-1995
		CN 1038571 A	10-01-1990
		DK 259790 A	27-12-1990
		EP 0414776 A	06-03-1991
		JP 3505814 T	19-12-1991
		MX 172350 B	14-12-1993
		NO 904619 A	27-12-1990
		NZ 228927 A	28-05-1991
		PT 90413 A, B	10-11-1989
		WO 8910068 A	02-11-1989
		US 5104674 A	14-04-1992
		US 5011701 A	30-04-1991
US 5482722 A	09-01-1996	NONE	
US 3769029 A	30-10-1973	CA 981103 A	06-01-1976
		ZA 7203367 A	28-03-1973
US 5476678 A	19-12-1995	NONE	
US 5527554 A	18-06-1996	AU 5823196 A	18-12-1996
		CA 2222638 A	05-12-1996
		EP 0828435 A	18-03-1998
		WO 9638050 A	05-12-1996
		JP 11505727 T	25-05-1999
		NO 975456 A	17-12-1997
GB 2152351 A	07-08-1985	NONE	
US 4601907 A	22-07-1986	NONE	
US 4097616 A	27-06-1978	FR 2338651 A	19-08-1977
		CA 1083878 A	19-08-1980